

Hazardous Substance Research Centers

EPA established the Hazardous Substance Research Centers (HSRC) Program to develop better, cheaper, faster, and safer methods to assess and clean up hazardous substances. HSRC's carry out an active program of basic and applied research, technology transfer, and training. Activities are conducted regionally by five multi-university centers, which focus on different aspects of hazardous substance management.

HSRC's bring together researchers from a variety of disciplines to collaborate on integrated research projects, which involve practical problems of hazardous substance management as well as long-term, exploratory research. HSRC's draw financial support from the Environmental Protection Agency (EPA), the Department of Energy, and the Department of Defense, with additional funding from academia, industry, and other state and federal government agencies. Research is being conducted in five HSRC's: Great Lakes & Mid-Atlantic; Great Plains-Rocky Mountain; Northeast; South & Southwest; and Western Region.

Current activities are found at the following web address: <http://www.hsrb.org>

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HSRC Mining-Related Research

(see <http://www.hsrb.org>, click on research, to view full abstract and contacts for the items noted below)

I. Great Plains-Rocky Mountain HSRC

Metals Research

The Role of Metallic Iron in the Biotransformation of Chlorinated Xenobiotics (Current)

Design and Development of an Innovative Industrial-Scale Process to Economically Treat Waste Zinc Residue (Current)

Simultaneous Transformation of Atrazine and Nitrate in Contaminated Water, Sediment, and Soil by Zero-Valent Iron-Promoted Processes (Current)

Nanoscale Metal Oxide Particles as Reagents for Destruction and Immobilization of Hazardous Substances in Air, Water, and/or as an Alternative to Incineration (Current)

Acid Producing Metalliferous Waste Reclamation by Material Reprocessing and Vegetative Stabilization (Completed)

Chelating Extraction of Heavy Metals from Contaminated Soils (Completed)

Design and Development of an Innovative Industrial Scale Process to Economically Treat Waste Zinc Residues (Completed)

Heavy Metals Removal from Contaminated Water Solutions (Completed)

Metals Soil Pollution and Vegetative Remediation (Completed)

Nano-Scale Metal Oxide Particles as Reagents for Destruction and Immobilization of Hazardous Substances (Completed)

Riparian Poplar Tree Buffer Impact on Non-point Source Surface Water Contamination: A Paired Agricultural Watershed Study (Completed)

Vegetative Interceptor Zones for Containment of Heavy Metal Pollutants (Completed)

Bioremediation Research

Biofilm Barriers for Waste Containment(Current)

Development of a Systematic Methodology for Optimally Designing Vegetative Systems for Remediating Contaminated Soil and Ground Water(Current)

Effects of Surfactants on the Bioavailability and Biodegradation of Contaminants in Soils

Evaluation and Modeling of Subsurface Biobarrier Formation and Persistence(Current)

Evaluation of Biosparging Performance and Process Fundamentals for Site Remediation(Current)

Field Scale Bioremediation: Relationship of Parent Compound Disappearance to Humification, Mineralization, Leaching, Volatilization of Transformation Intermediates(Current)

Plant-Assisted Remediation of Soil and Groundwater Contaminated by Hazardous Organic Substances: Experimental and Modeling Studies(Completed)

Contaminant Binding to the Humin Fraction of Soil Organic Matter (Completed)

Vegetative Interceptor Zones for Containment of Heavy Metal Pollutants(Completed)

Fate and Transport Research

Contaminant Binding to the Humin Fraction of Soil Organic Matter (Current)

Fate and Transport of Heavy Metals and Radionuclides in Soil: The Impacts of Vegetation (Current)

The Fate and Transport of Munitions Residues in Contaminated Soil (Current)

Formation and Transformation of Pesticide Degradation Products Under Various Electron Acceptor Conditions (Current)

Use of Poplar Trees in Remediating Heavy Metal Contaminated Sites (Current)

II. Northeast HSRC

Detection and Remediation Research

Electrochemical Sensor for Heavy Metals in Groundwater: Phase IV (Current)

Novel Molecular Tools for Monitoring In-Situ Bioremediation (Current)

Development of a Thermal Desorption Gas Chromatograph/Microwave Induced Plasma/Mass Spectrometer (TDGC/MIP/MS) for On-site Analysis of Organic and Metal Contaminants (Completed)

Application of Advanced Waste Characterization to Soil Washing and Treatment (Completed)

Surfactant Selection Protocol for Optimizing Ex Situ Soil Washing (Completed)

Development of a Method for Removal of Nonvolatile Organic Materials from Soil Using Flotation (Completed)

Development of GC/MIP//MS for on-site Analysis of Organics and Metal Contaminants (Completed)

FTIR Analysis of Gaseous Products from Hazardous Waste Combustion (Completed)

Mixed Metal Removal and Recovery by Hollow Fiber Membrane-Based Extractive Adsorber (Completed)

Superfund Sites and the Mineral Industries Methods (Completed)

III. South & Southwest HSRC

Detection and Remediation Research

Evaluation of Placement and Effectiveness of Sediment Caps (Completed)

Bioremediation Research

Freshwater Bioturbators in Riverine Sediments as Enhancers of Contaminant Release (Completed)

The Application of Plant Biotechnology in Bioremediation of Contaminated Sediments (Completed)

Fate and Transport Research

Mobilization and Fate of Inorganic Contaminants Due to Resuspension of Cohesive Sediment (Completed)

IV. Western Region HSRC

Metals Research

Assessing Metal Speciation in the Subsurface Environment: John C. Westall, Oregon State University

Simultaneous Removal of the Adsorbable and Electroactive Metals from Contaminated Soils and Groundwater: Peter O. Nelson, Oregon State University

Magnetic Resonance Studies of Heavy Metals in Clays, Zeolites and Ceramics: Cynthia J. Hartzell and Michael P. Eastman, Department of Chemistry, Northern Arizona University

Reductive Dehalogenation at Carbon and Derivatized Carbon Electrodes: Merritt Helvenston, New Mexico Highlands University

Incorporation of Nickel in a Ceramic Matrix - A Method for Treatment and Disposal of Heavy Metal Containing Wastes: George Redden and James O. Leckie, Stanford University

Trace Element Adsorption in Porous Particle Packed Beds: James O. Leckie, Stanford University

Arsenic Removal in High Capacity Porous Alumina Packed-Bed Reactors